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MODE	DATA RATE (Mbps)	TARGET APPLICATION	RECEIVER SENSITIVITY	POWER CONSUMPTION ('2001)	
				Rx AVERAGE	Tx AVERAGE
MODE 1.0 (BLUETOOTH)	1 Mbps		-84 dBm	25 mW	15 mW
MODE 2.0	2.6-3.9 Mbps	AUDIO	-78 dBm	30 mW	20 mW
MODE 3.0	22-44 Mbps	VIDEO, COMPUTER GRAPHICS	-69 dBm	95 mW	60 mW

FIG. 1

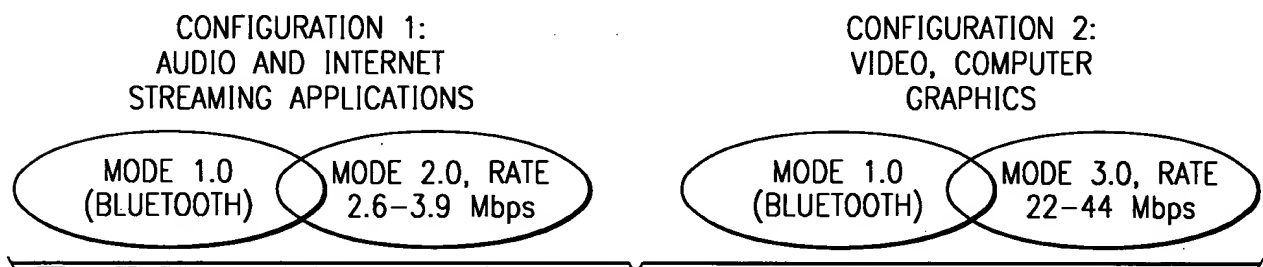


FIG. 2

FREQUENCY OFFSET	TRANSMIT POWER
+/- 550 kHz	-20 dBc
$ M-N =2$	-20 dBm
$ M-N \geq 3$	-40 dBm

FIG. 4

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PARAMETERS	MODE 1 (BLUETOOTH)	MODE 2
FREQUENCY HOPPING	1600 Hz	SAME AS BLUETOOTH
FILTER SPECTRUM		SAME AS BLUETOOTH
MODULATION	GFSK	16, 64 QAM
MAXIMUM DATA RATE	1 Mbps	2.6, 3.9 Mbps
ACQUISITION		USING MODE 1 THEN SWITCH TO MODE 2
TRANSMIT POWER	0 dBm	0 dBm, 6 dBm
DISTANCE	10 m	10 m
NOMINAL PACKET ERROR RATE	10%	10%
MARGIN + NOISE FIGURE	37 dB	37 dB
RECEIVER SENSITIVITY	-84 dBm	-84, -78 dBm
CODING	ARQ	ARQ + CONVOLUTIONAL CODE ACROSS PACKETS

FIG. 3

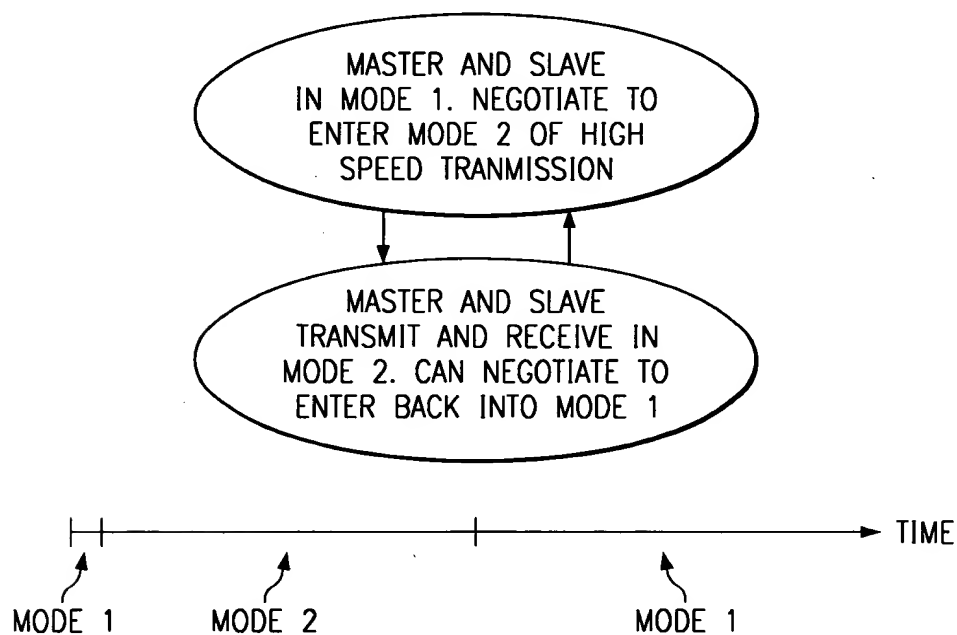


FIG. 5

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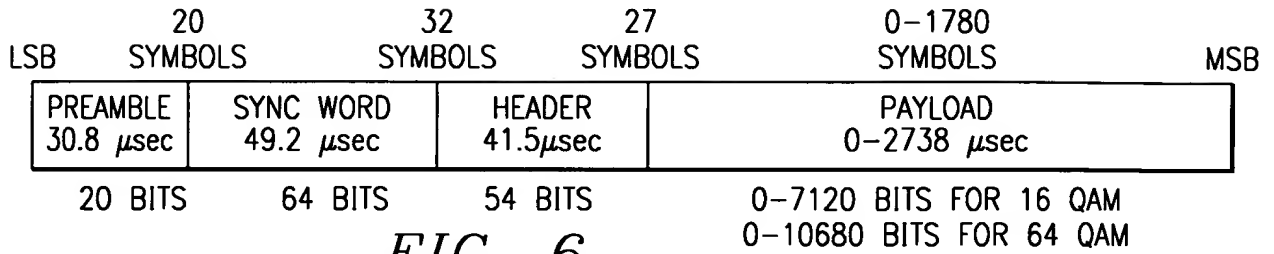


FIG. 6

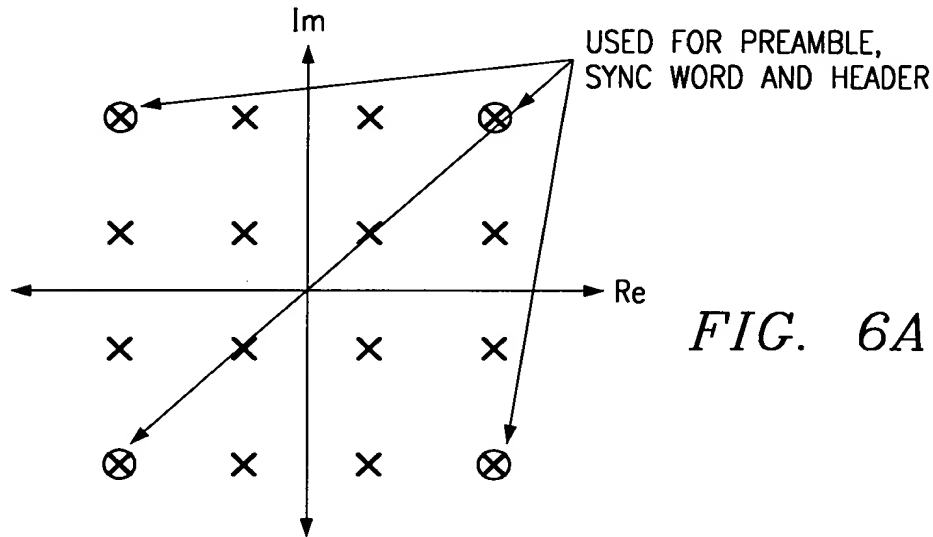


FIG. 6A

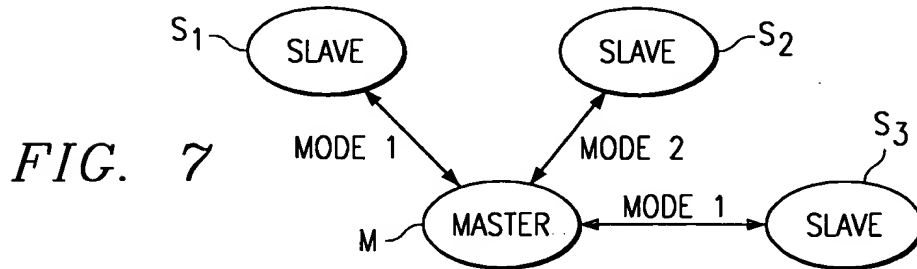


FIG. 7

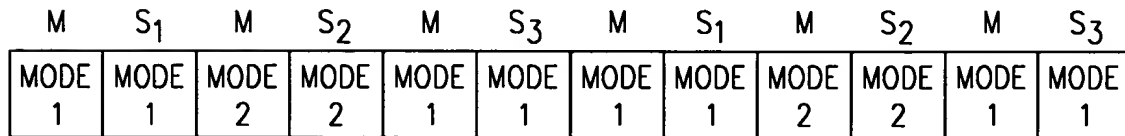


FIG. 8

TIME →

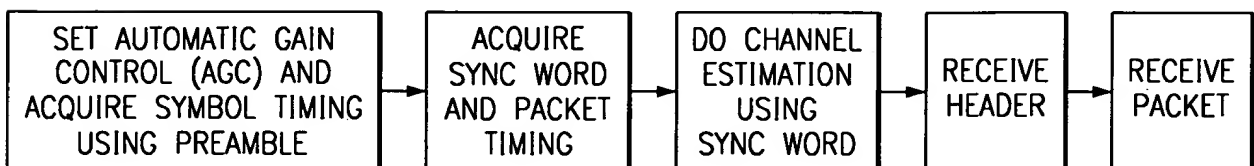
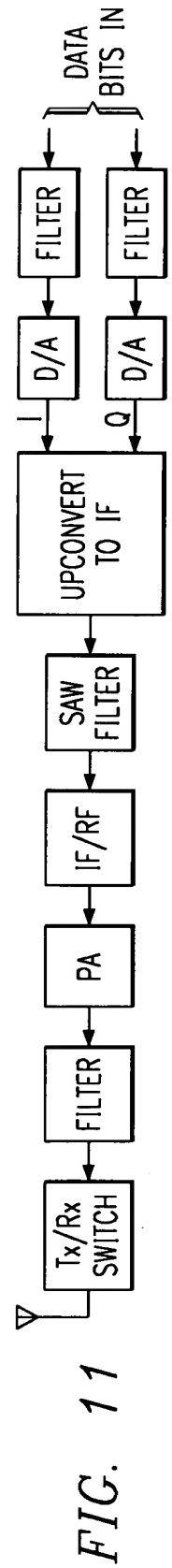
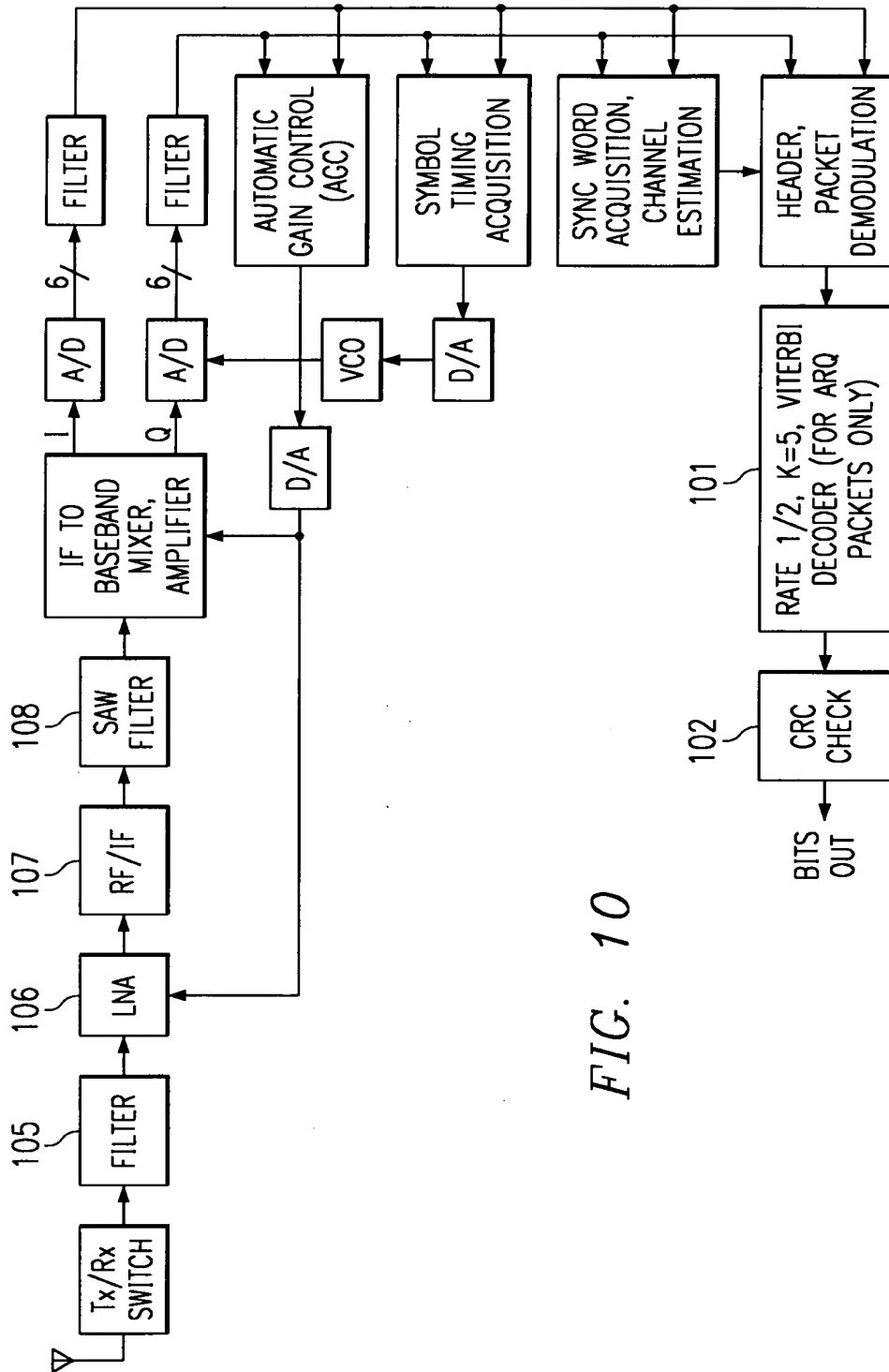


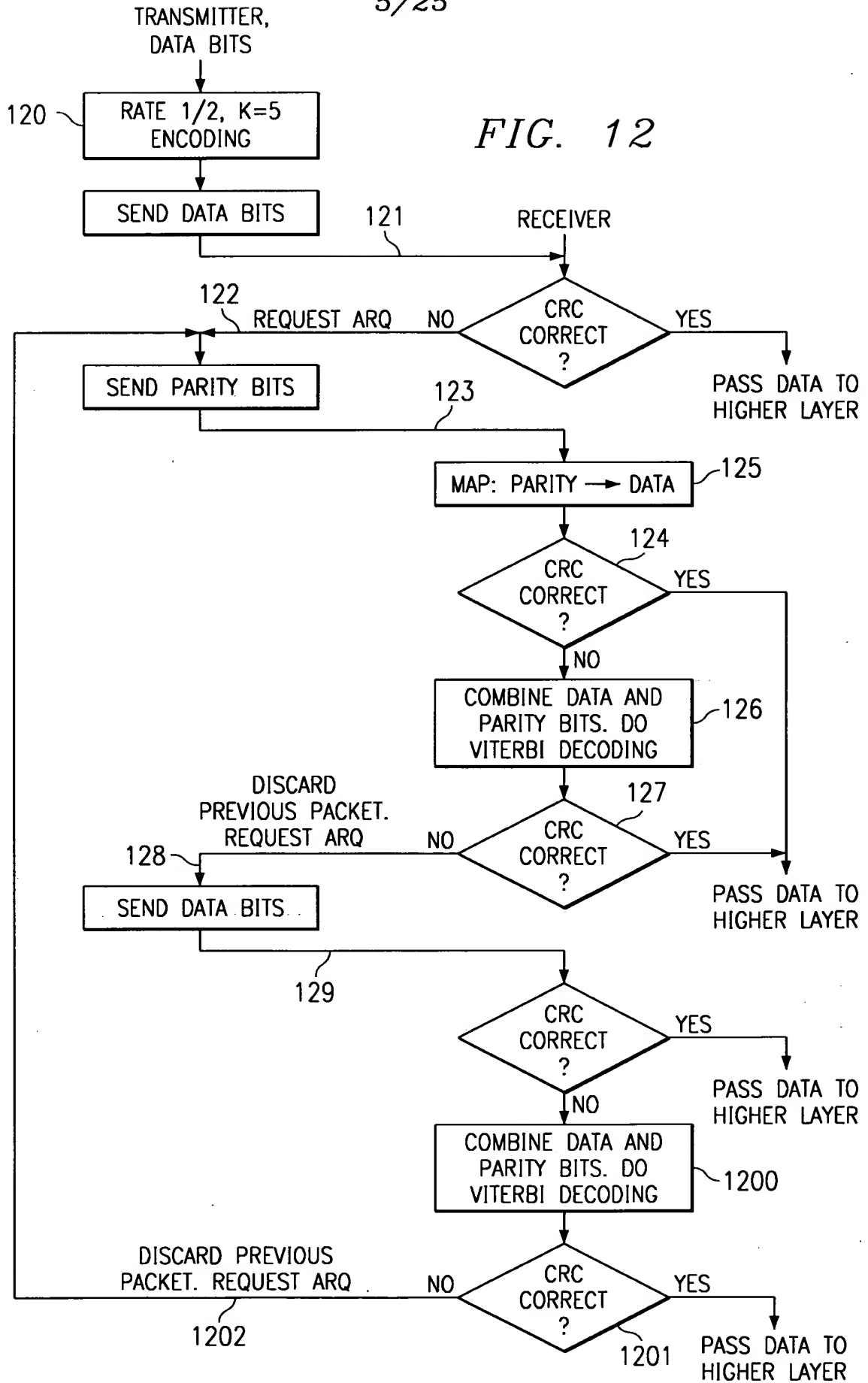
FIG. 9

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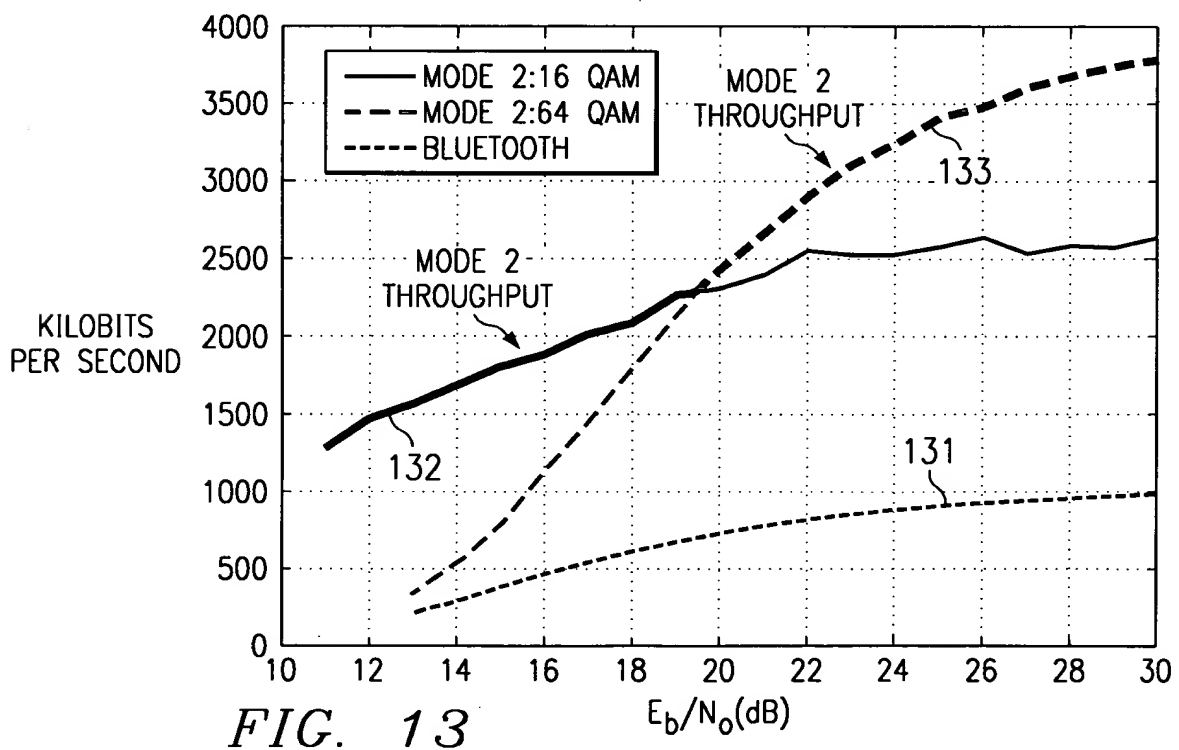
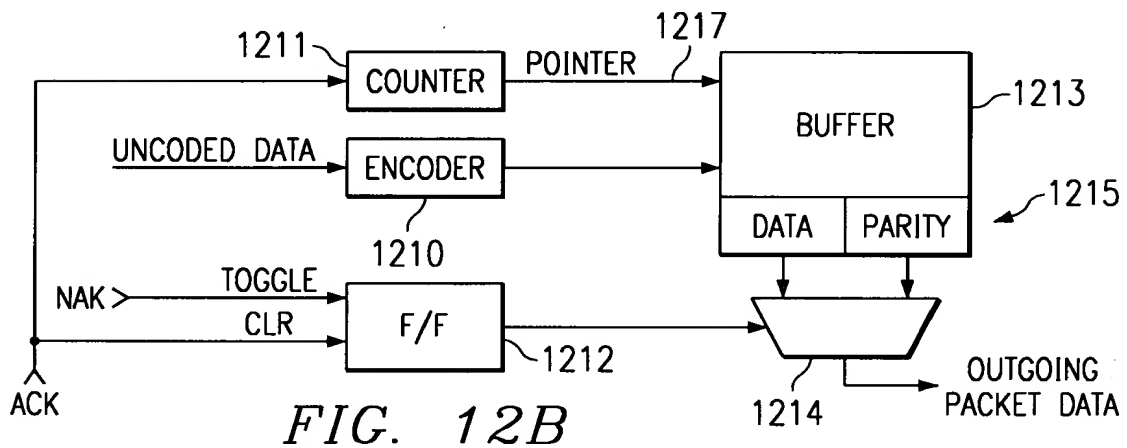
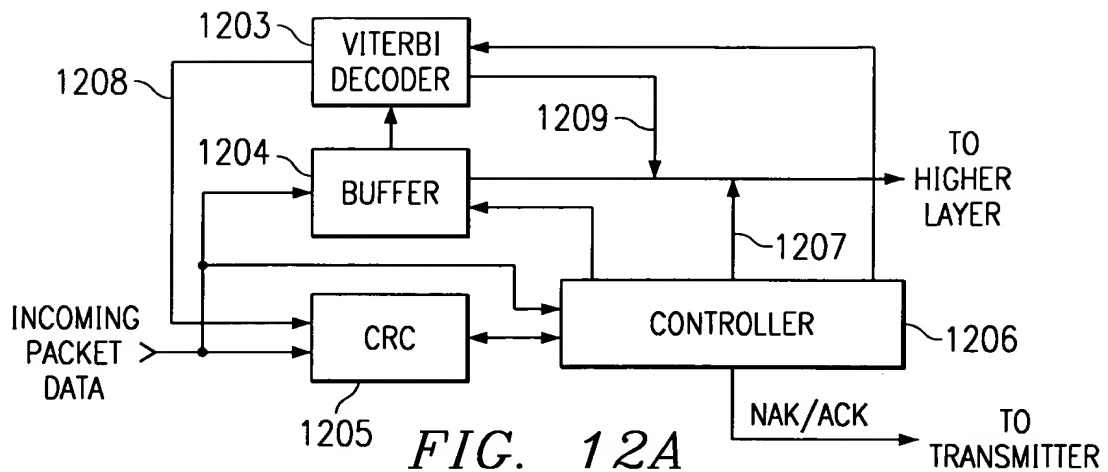


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FIG. 12



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Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	

PARAMETERS	1	2	3	4	5
FILTER SPECTRUM	802.11b	802.11b	802.11b	802.11b	802.11b
MODULATION	QPSK	QPSK	16 QAM	16 QAM	16 QAM
SCRAMBLING CODE LENGTH	256	256	256	256	256
PHYSICAL DATA RATE	22 Mbps	22 Mbps	44 Mbps	44 Mbps	44 Mbps
CODING	RATE 1/2, TURBO (SCCC)	NONE	RATE 1/2, TURBO (SCCC)	RATE 3/4, TURBO (SCCC)	NONE
ARQ	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL
MAXIMUM DATA RATE	11 Mbps	22 Mbps	22 Mbps	33 Mbps	44 Mbps
TRANSMIT POWER	-1 dBm	8 dBm	4 dBm	8 dBm	15 dBm
DISTANCE	10 m	10 m	10 m	10 m	10 m
BIT ERROR RATE	1e-8	1e-8	1e-8	1e-8	1e-8
PACKET ERROR RATE	1e-4	1e-4	1e-4	1e-4	1e-4
MARGIN + NOISE FIGURE	37 dB	37 dB	37 dB	37 dB	37 dB
RECEIVER SENSITIVITY	-85 dBm	-76 dBm	-80 dBm	-76 dBm	-69 dBm
FREQUENCY DIVERSITY	BAND SELECTION	BAND SELECTION	BAND SELECTION	BAND SELECTION	BAND SELECTION
SYMBOL RATE	11 Msps	11 Msps	11 Msps	11 Msps	11 Msps
SPREADING	11 Mcps	11 Mcps	11 Mcps	11 Mcps	11 Mcps

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	MAXIMUM DATA RATE	MODULATION	SYMBOL RATE	CODING	SPREADING
18	18 Mbps	QPSK	18 Msps	RATE 1/2	18 Mchips/sec
19	36 Mbps	QPSK	18 Msps	RATE 1	18 Mchips/sec
20	36 Mbps	16 QAM	18 Msps	RATE 1/2	18 Mchips/sec
21	54 Mbps	16 QAM	18 Msps	RATE 3/4	18 Mchips/sec
22	72 Mbps	16 QAM	18 Msps	RATE 1	18 Mchips/sec

FIG. 14A

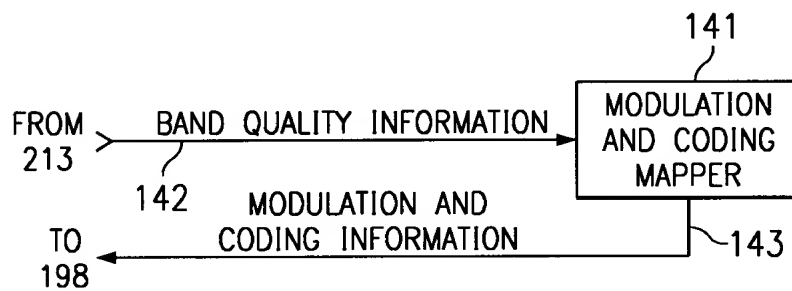


FIG. 14B

PARAMETERS	6	7	8	9	10
FILTER SPECTRUM	802.11b	802.11b	802.11b	802.11b	802.11b
MODULATION	QPSK	QPSK	QPSK	QPSK	QPSK
SCRAMBLING CODE LENGTH	256	256	256	256	256
PHYSICAL DATA RATE	22 Mbps	22 Mbps	22 Mbps	22 Mbps	22 Mbps
CODING	RATE 1/2, TURBO	RATE 2/3, TURBO	RATE 3/4, TURBO	RATE 4/5, TURBO	RATE 5/6, TURBO
ARQ	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL
MAXIMUM DATA RATE	11 Mbps	14.67 Mbps	16.5 Mbps	17.6 Mbps	18.33 Mbps

FIG. 14C

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PARAMETERS	11	12	13	14	15	16	17
FILTER SPECTRUM	802.11b	802.11b	802.11b	802.11b	802.11b	802.11b	802.11b
MODULATION	8-PSK	8-PSK	8-PSK	8-PSK	8-PSK	8-PSK	8-PSK
SCRAMBLING CODE LENGTH	256	256	256	256	256	256	256
PHYSICAL DATA RATE	33 Mbps	33 Mbps	33 Mbps	33 Mbps	33 Mbps	33 Mbps	33 Mbps
CODING	NONE	RATE 1/3, TURBO	RATE 1/2, TURBO	RATE 2/3, TURBO	RATE 3/4, TURBO	RATE 4/5, TURBO	RATE 5/6, TURBO
ARQ	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL
MAXIMUM DATA RATE	33 Mbps	11 Mbps	16.5 Mbps	22 Mbps	24.75 Mbps	26.4 Mbps	27.5 Mbps

FIG. 14D

FREQUENCY OFFSET	TRANSMIT POWER
f_c	0 dBc
+/- 11 MHz	-30 dBc
+/- 22 MHz	-50 dBm

FIG. 15

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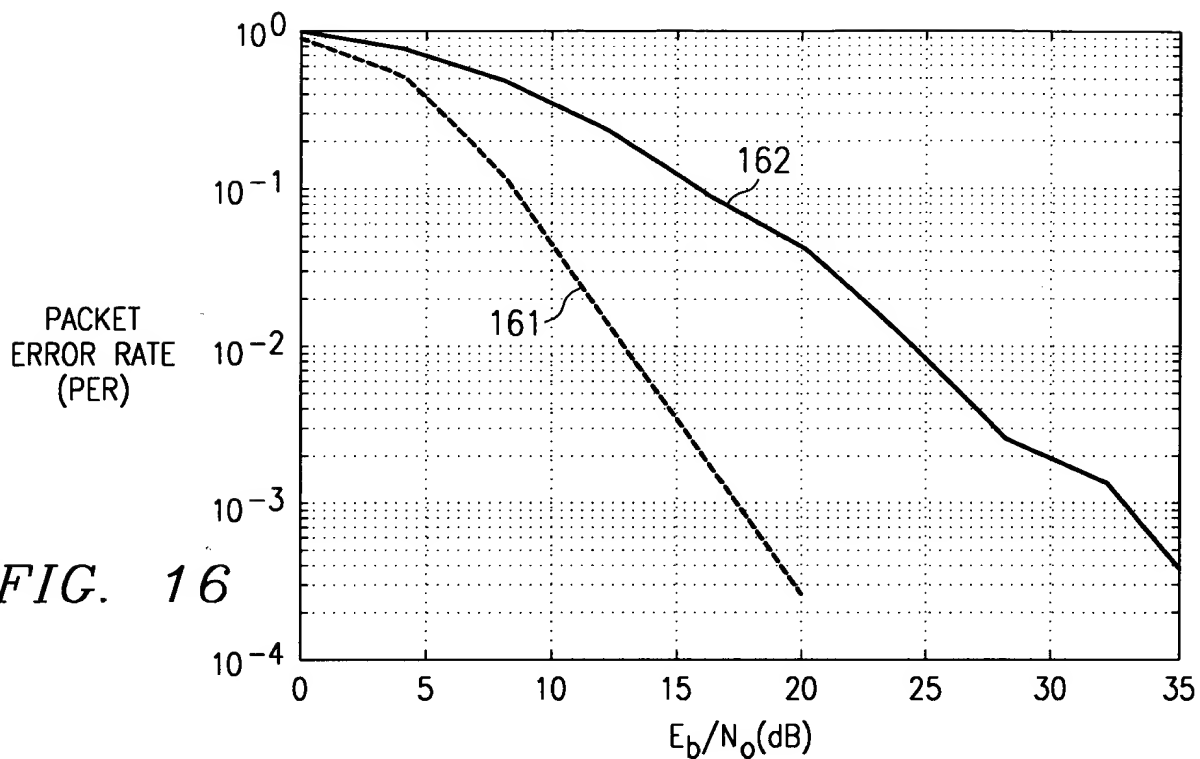


FIG. 17

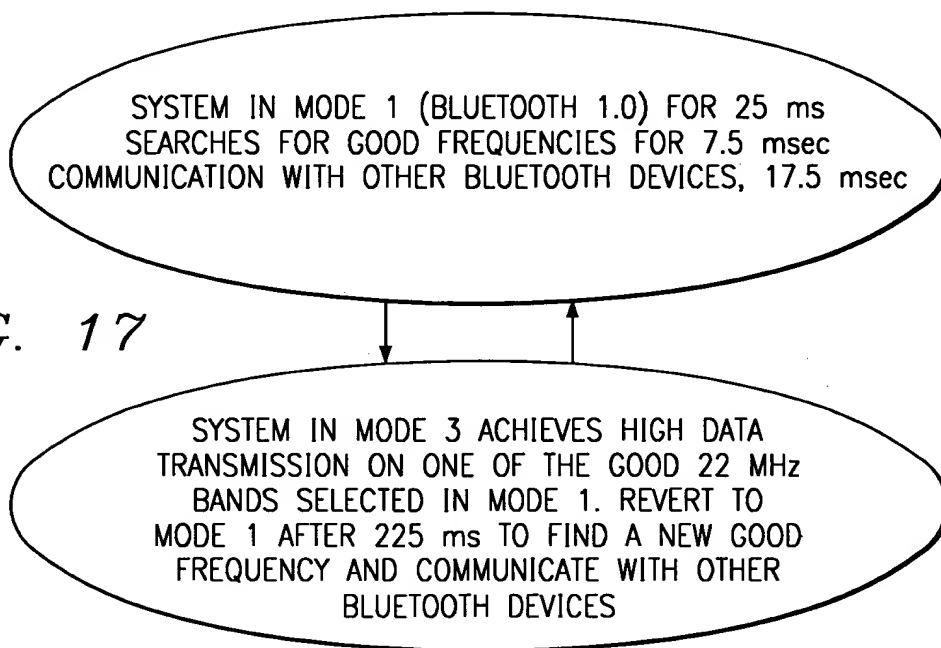
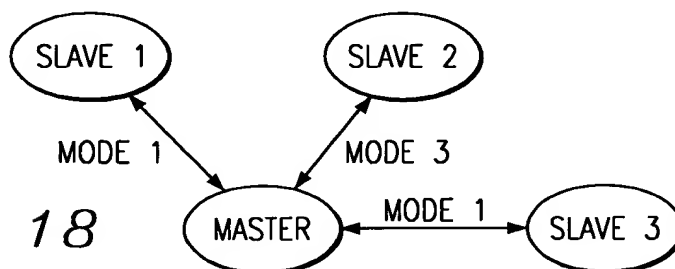


FIG. 18



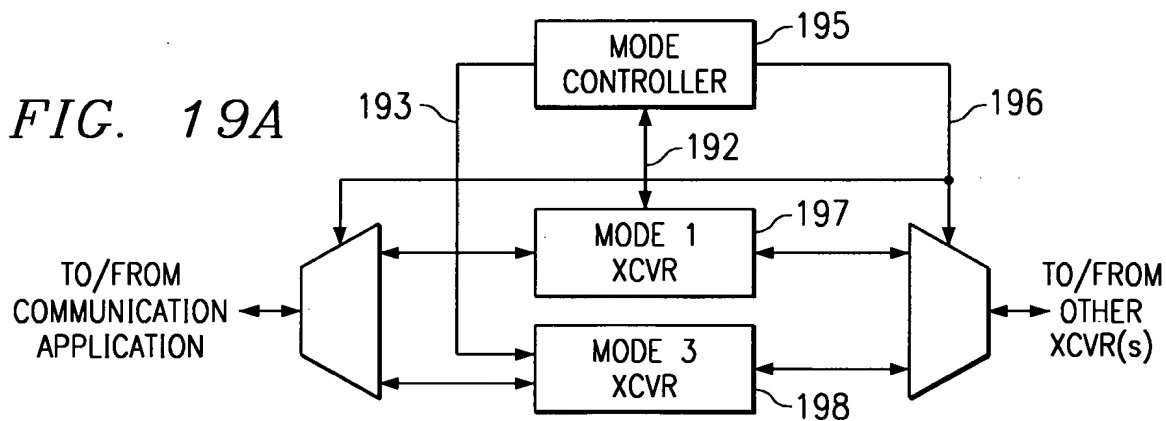
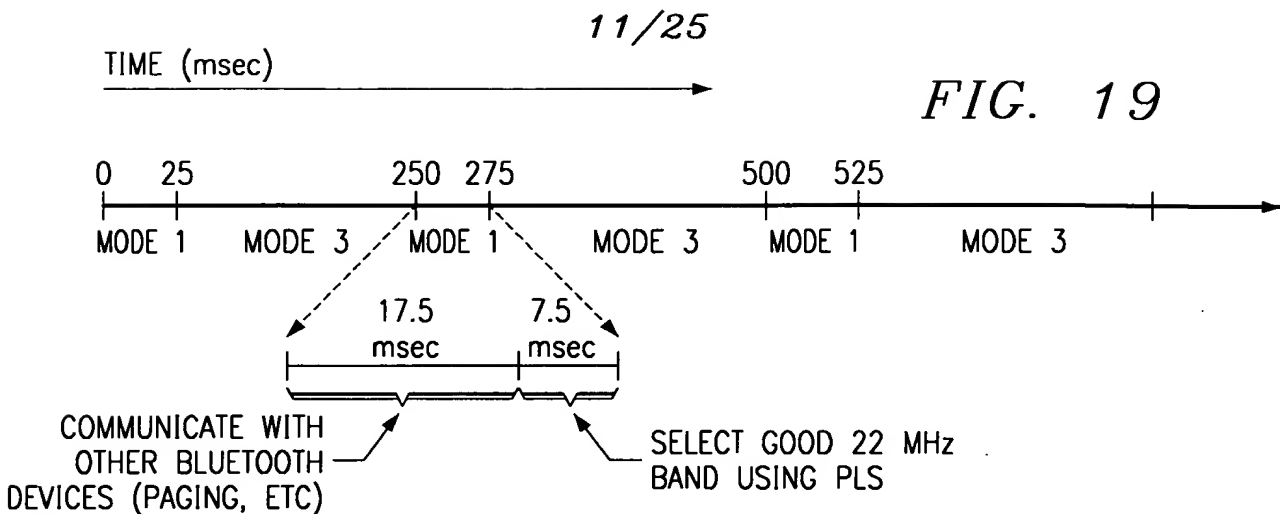


FIG. 20

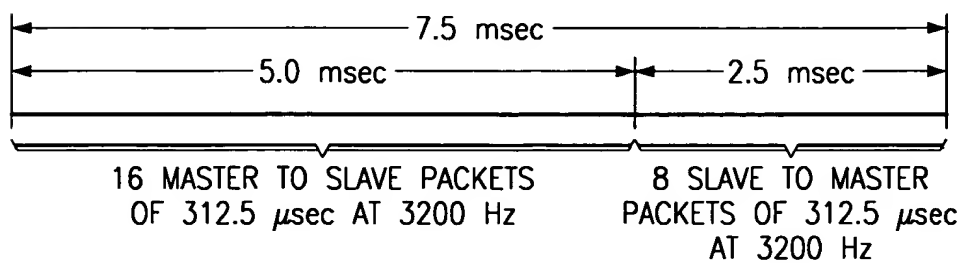
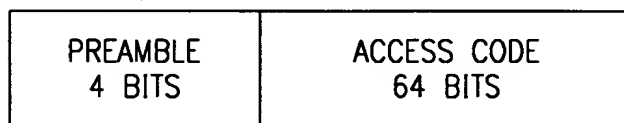


FIG. 21

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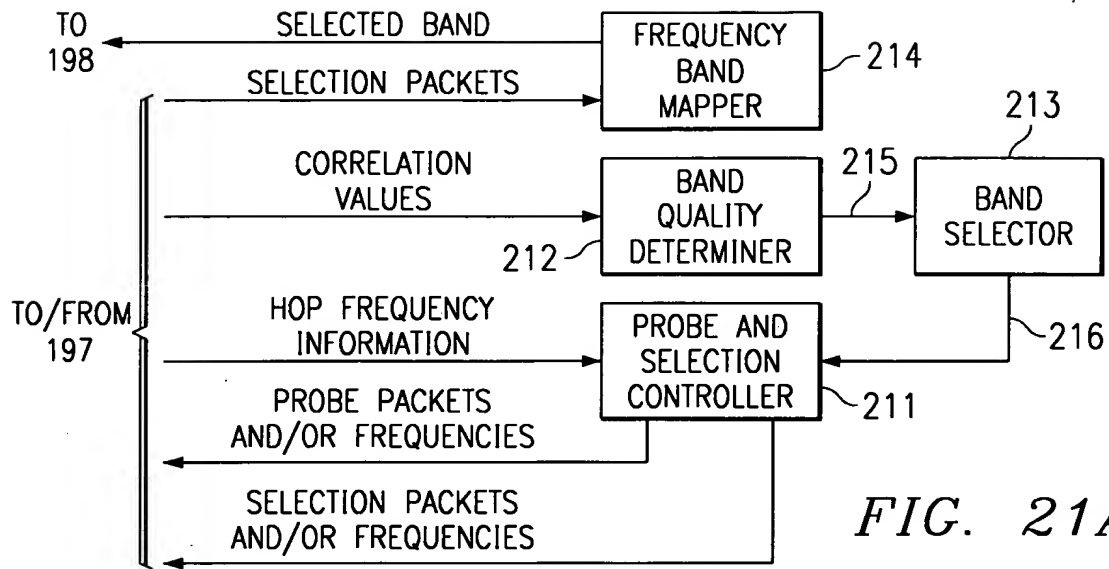


FIG. 21A

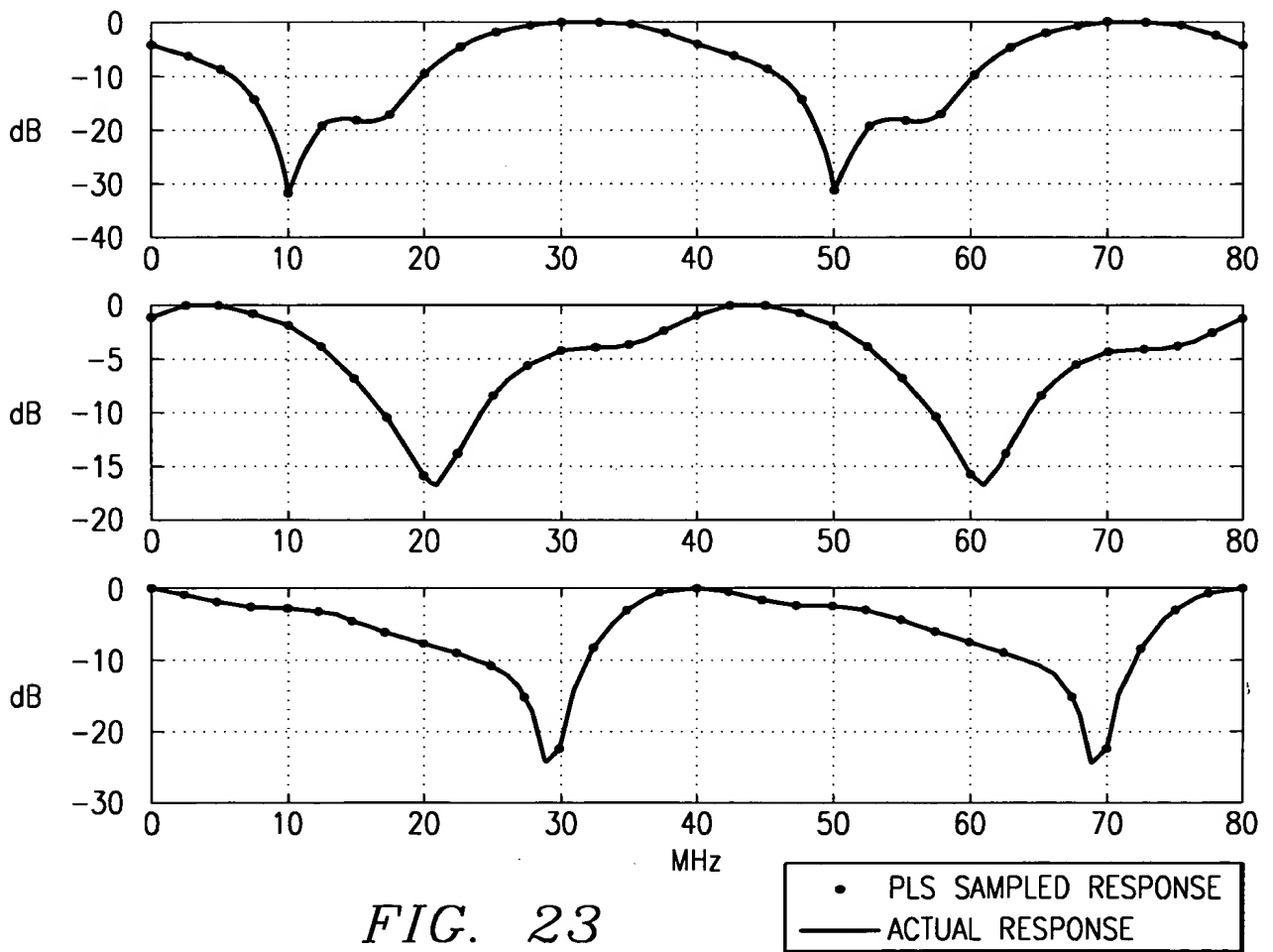


FIG. 23

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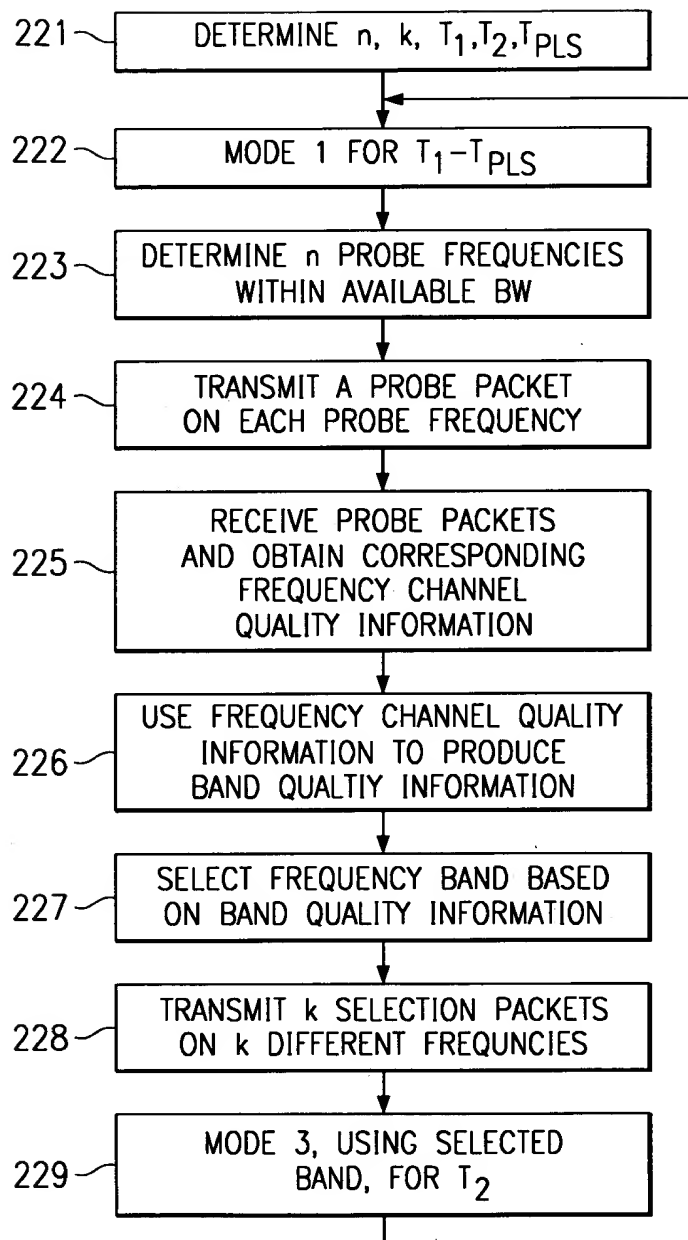


FIG. 21B

PREAMBLE 4 BITS	ACCESS CODE 64 BITS	CHANNEL EDGE FREQUENCY INDEX $6 \times 3 = 18$ BITS
--------------------	------------------------	---

FIG. 22

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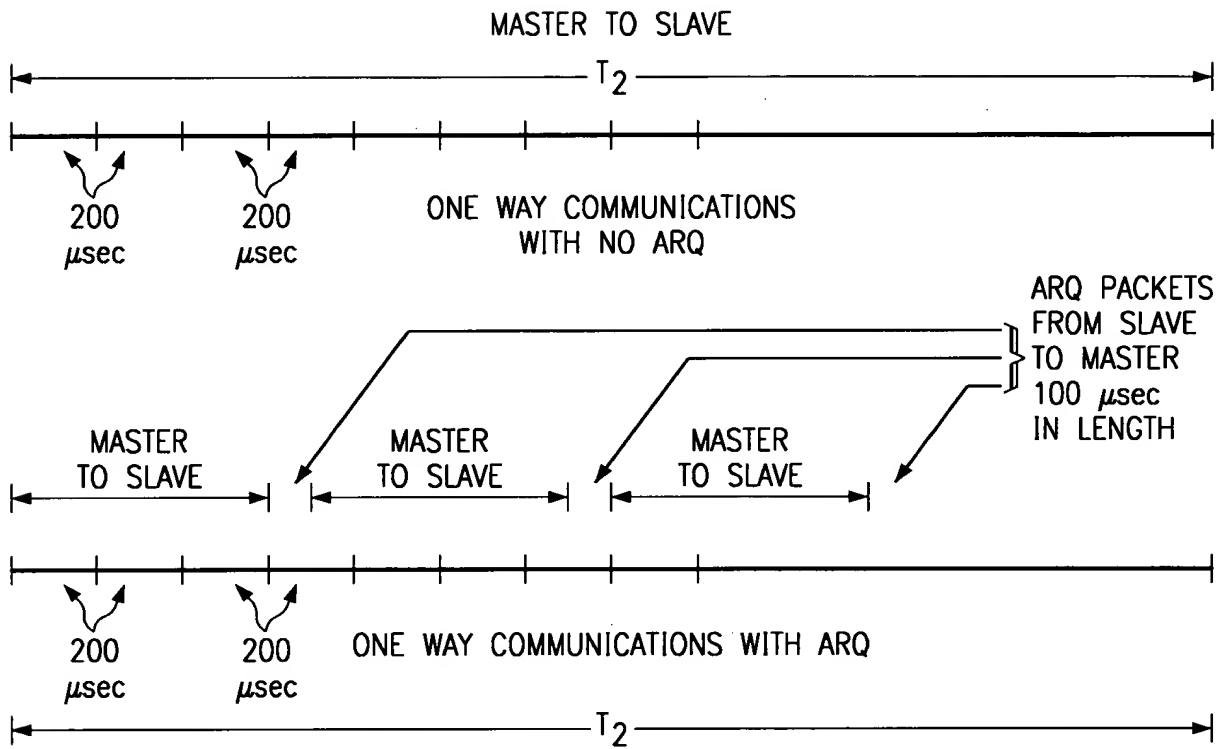


FIG. 24

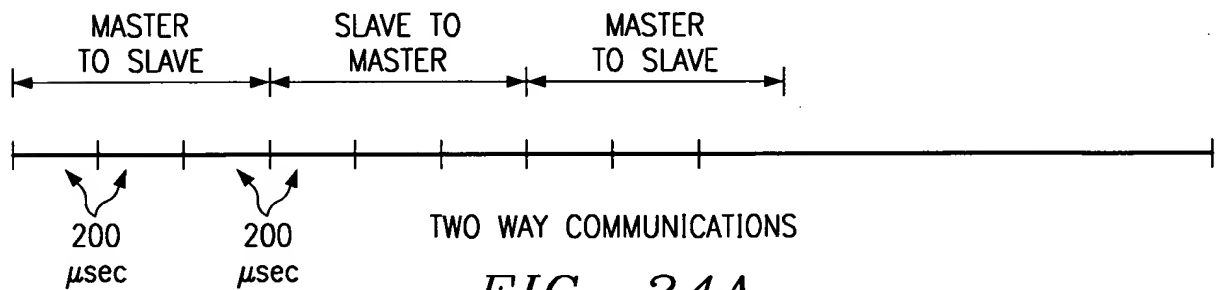
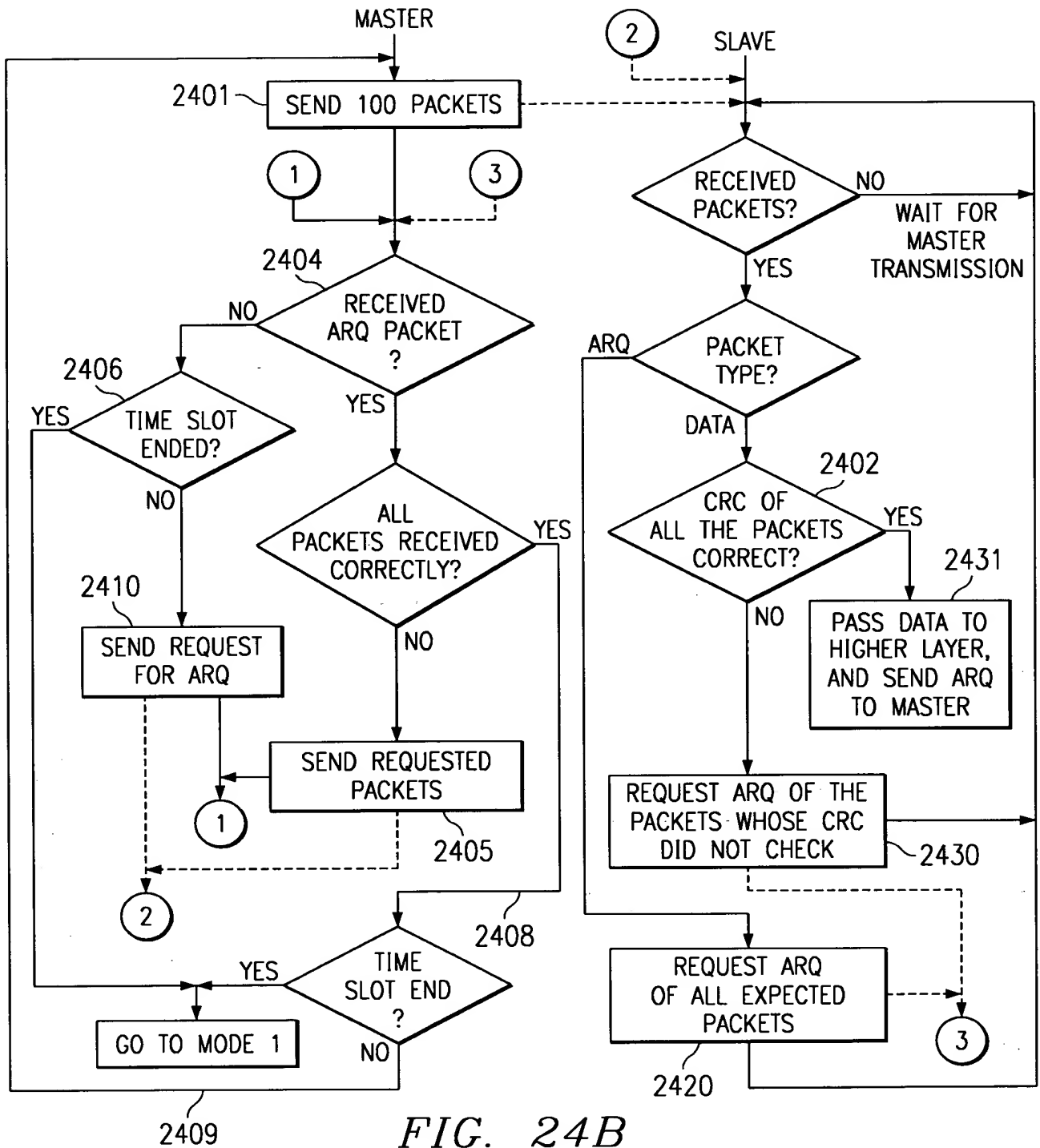


FIG. 24A



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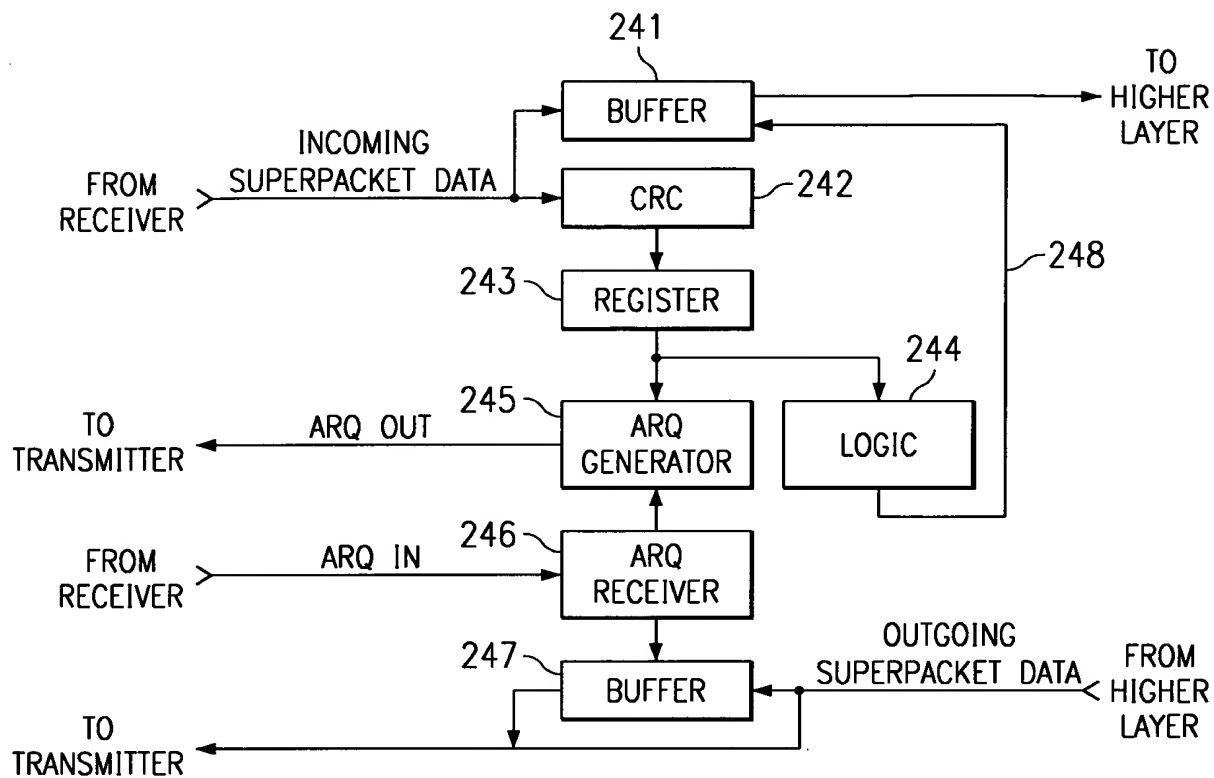


FIG. 24C

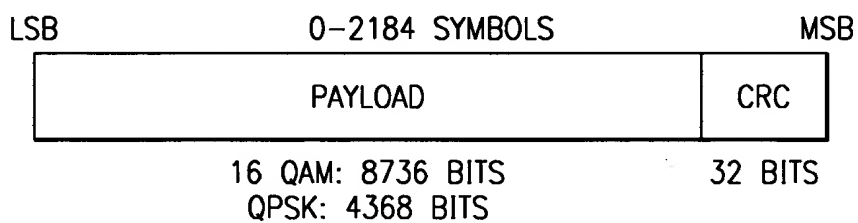


FIG. 25

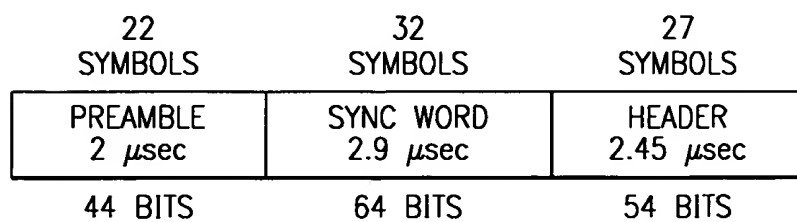


FIG. 26

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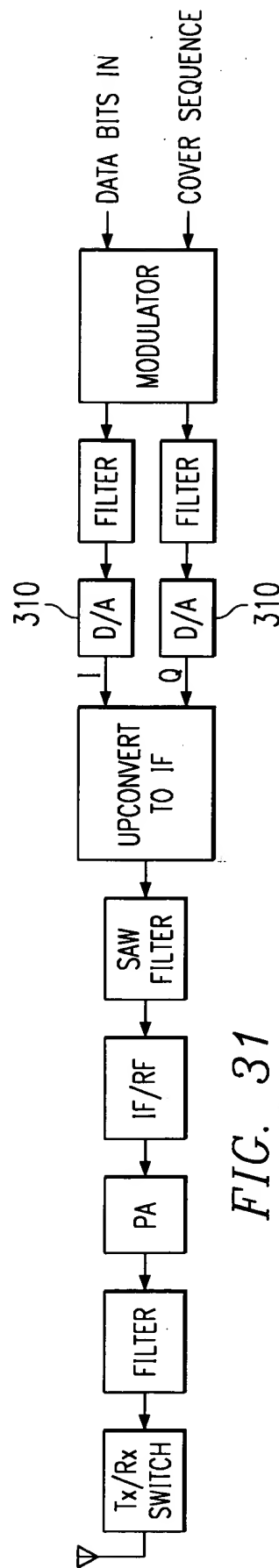
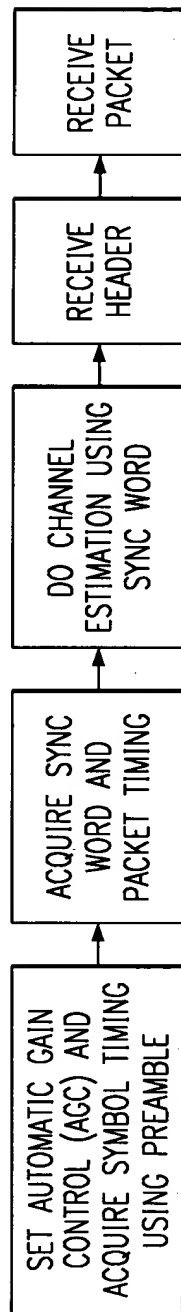
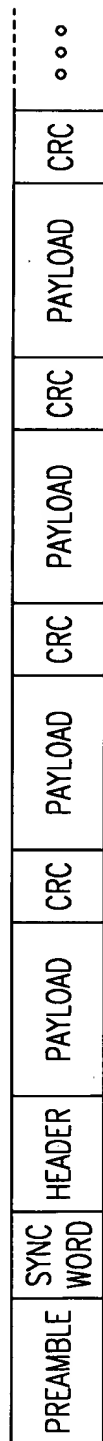
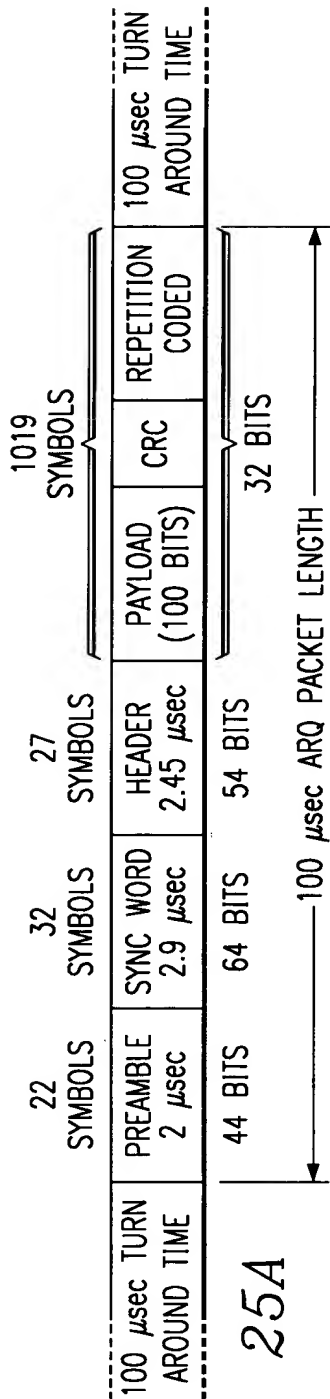
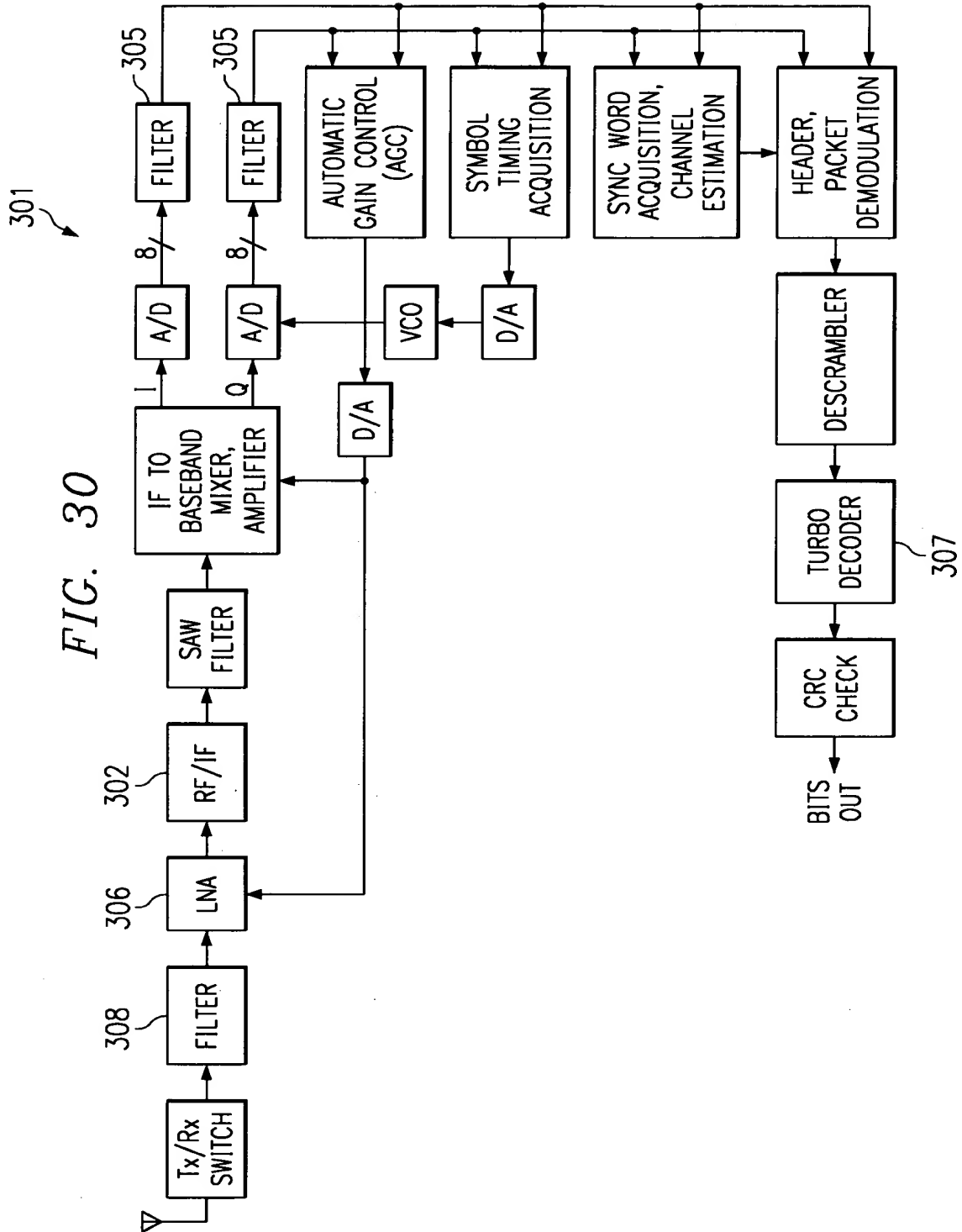


FIG. 28

MPEG2 HDTV VIDEO TRANSMISSION USING MODE 3	
VIDEO DATA RATE	18 Mbps
VIDEO FRAMES/SEC	24
VIDEO FRAMES/MODE 3 SLOT	6
MODE 3 DATA RATE	44 Mbps, 11 MSPS
CODING	RATE 1/2, TURBO
MODULATION	16 QAM
TIME IN BLUETOOTH MODE (T_1 msec)	25 msec
TIME IN BLUETOOTH MODE FOR OTHER DEVICES	17.5 msec
TIME IN BLUETOOTH MODE FOR PAL	7.5 msec
SLOT TIME IN MODE 3 (T_2 msec)	225 msec
MODE 3 PACKET SIZE	4.4 Kbits
DATA BITS/PACKET	4368
CRC BITS/PACKET	32
MODE 3 PACKET LENGTH	200 μ sec
NUMBER OF PACKETS/SLOT	1030
LENGTH OF TRAINING SEQUENCE	81 SYMBOLS, 7.36 μ sec
NUMBER OF PACKETS/TRAINING SEQUENCE	10
NUMBER OF PACKETS/ARQ	100
NUMBER OF TRAINING SEQUENCES/PACKET	103
TIME REQUIRED TO TRANSMIT VIDEO FRAMES (NO ARQ)	$204.5 + 1.5 + 0.76 = 206.76$ msec
ARQ RATE	9%
TIME REQUIRED TO TRANSMIT VIDEO FRAMES WITH ARQ	225 msec

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FIG. 30



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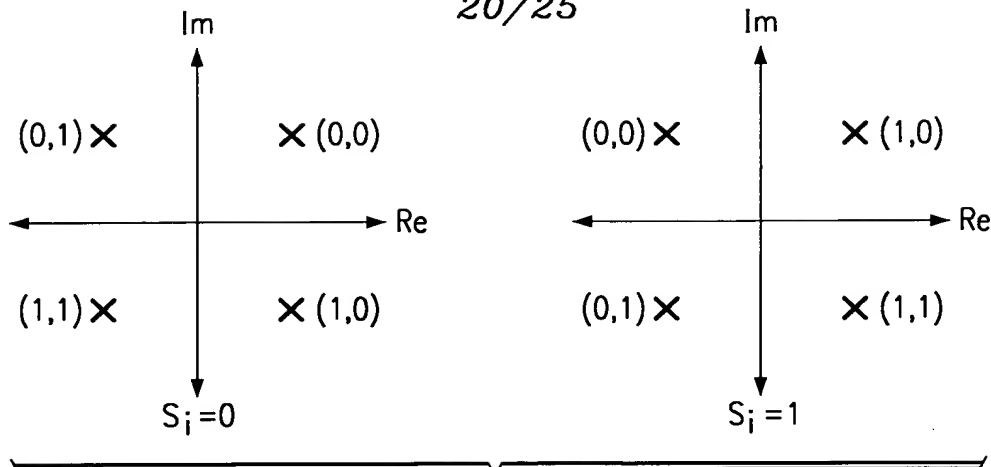


FIG. 32

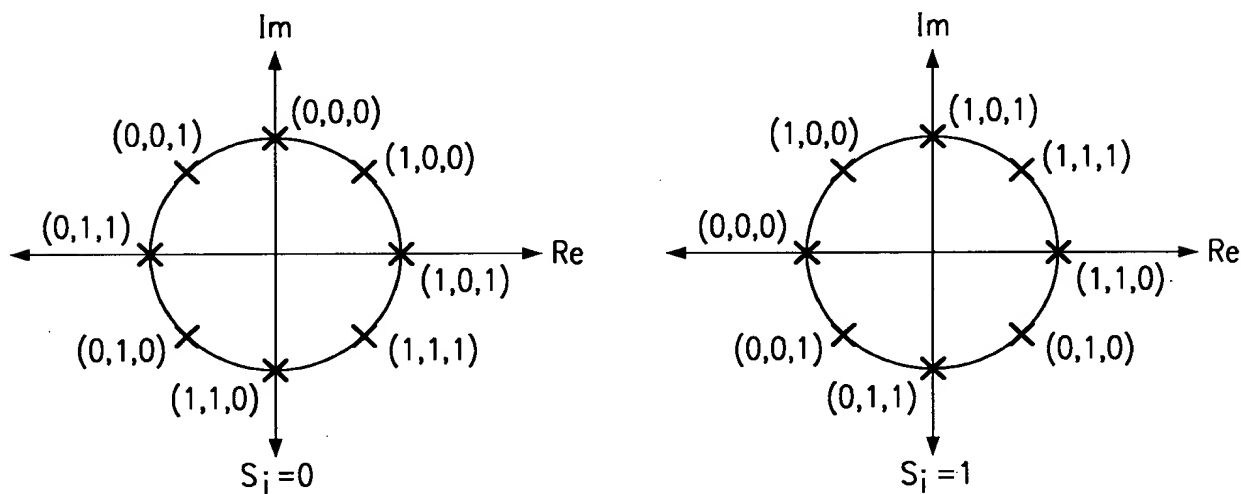


FIG. 32A

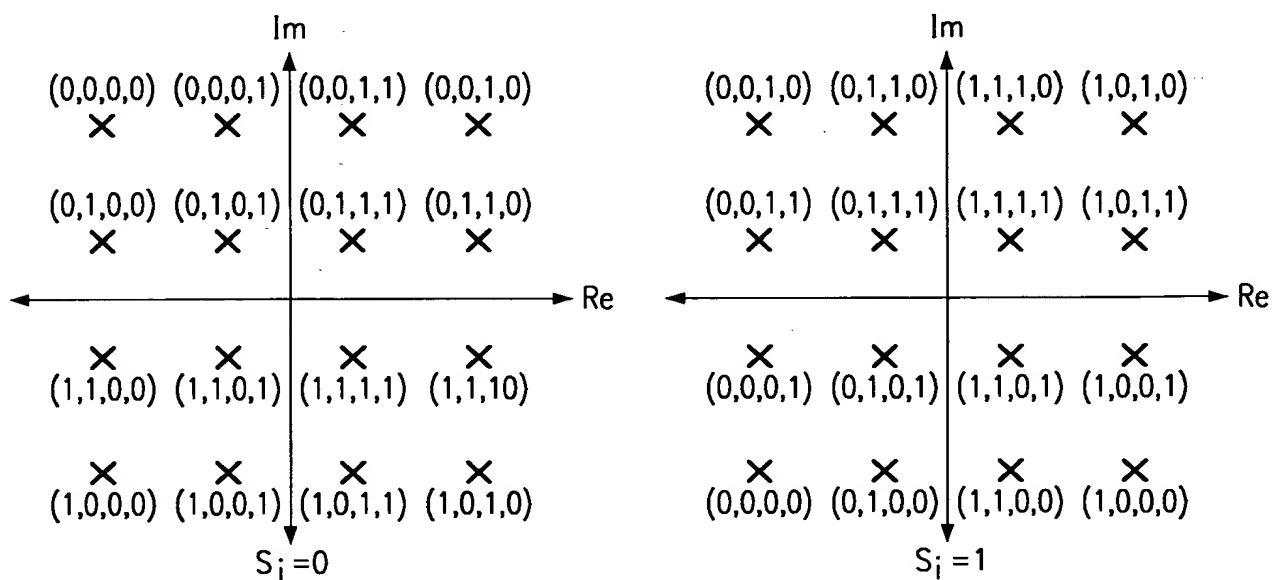


FIG. 33

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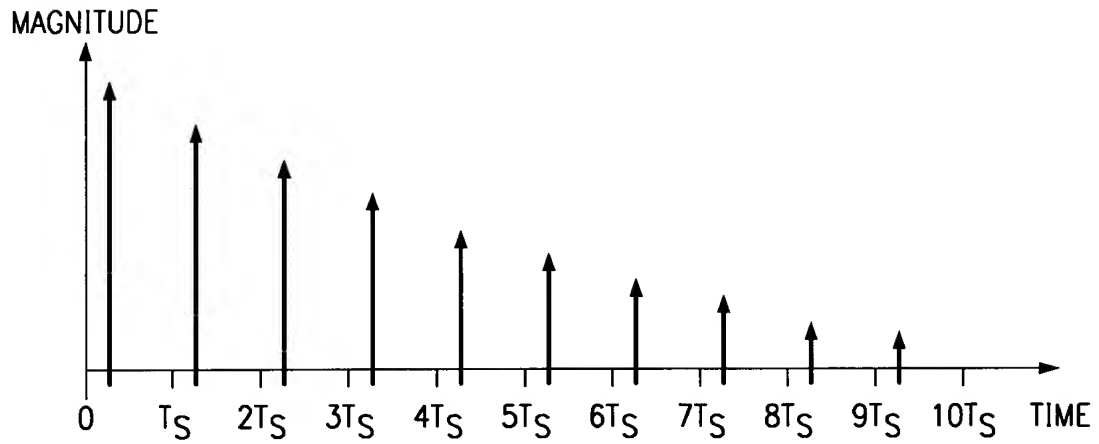


FIG. 34

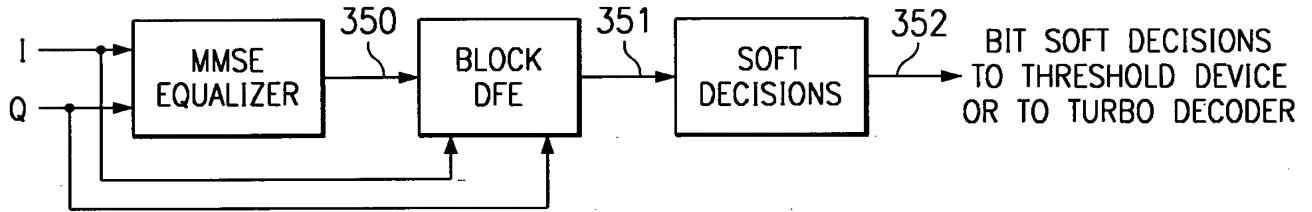


FIG. 35

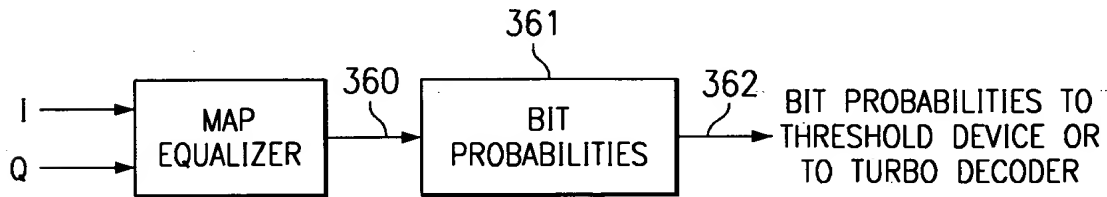


FIG. 36

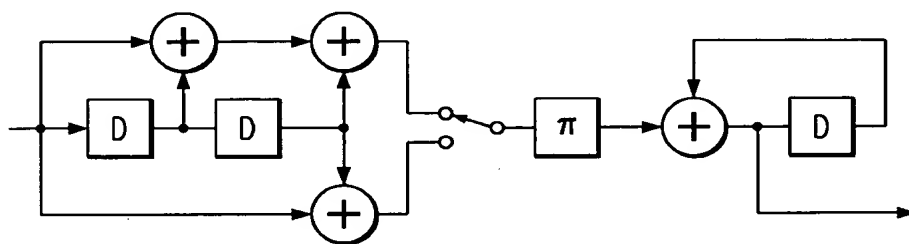


FIG. 37

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FIG. 38

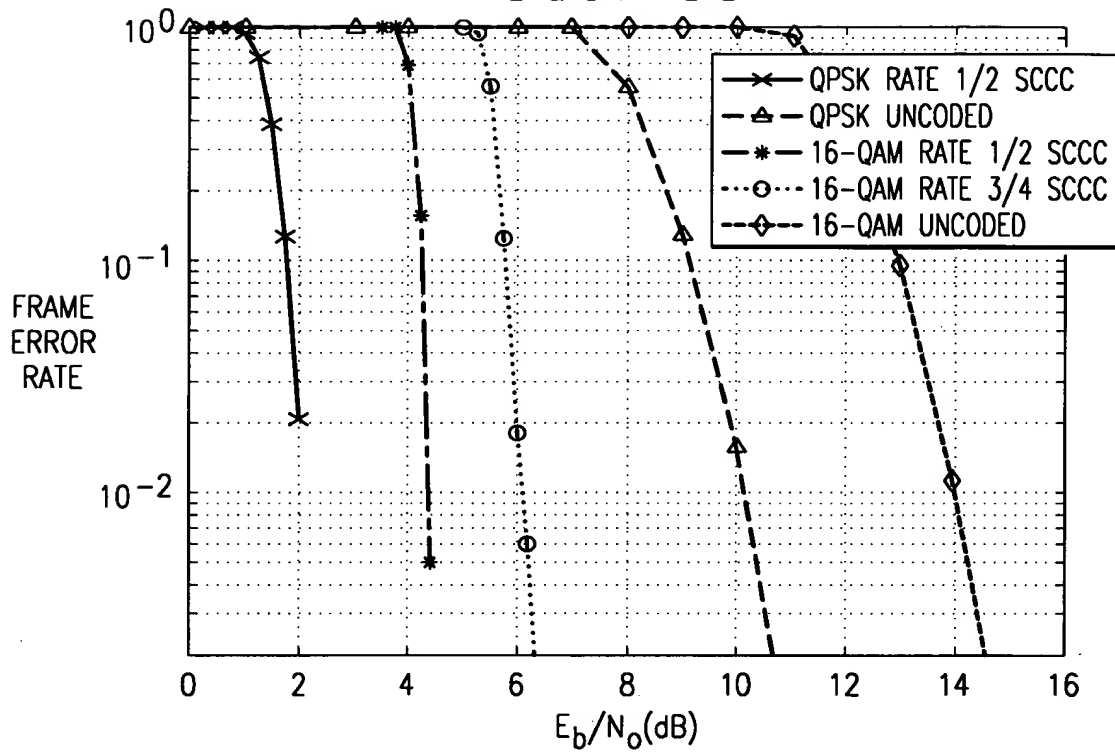
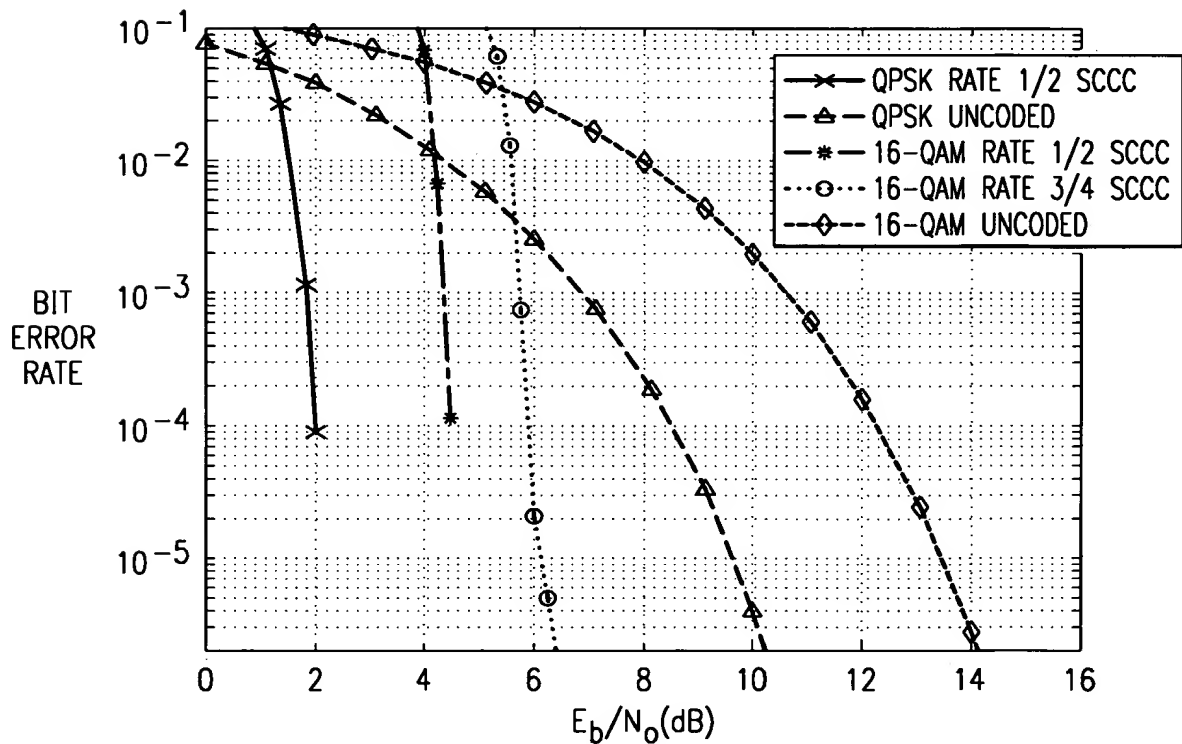


FIG. 39



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FIG. 40

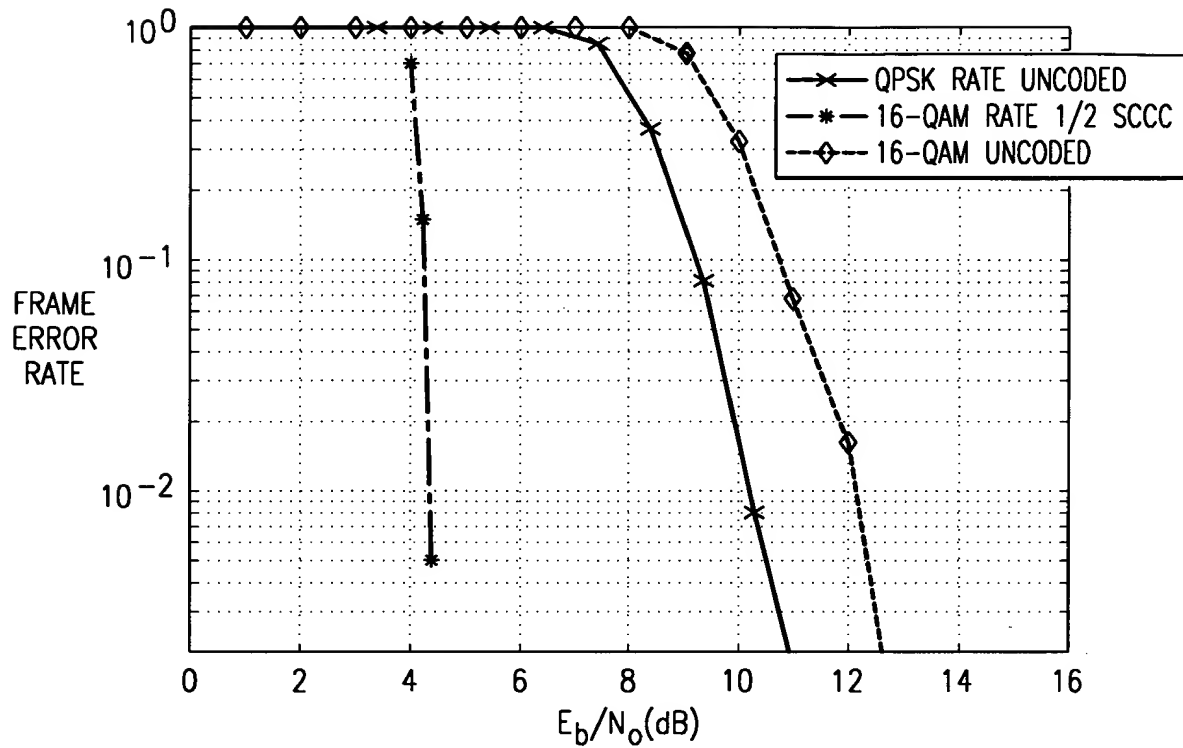
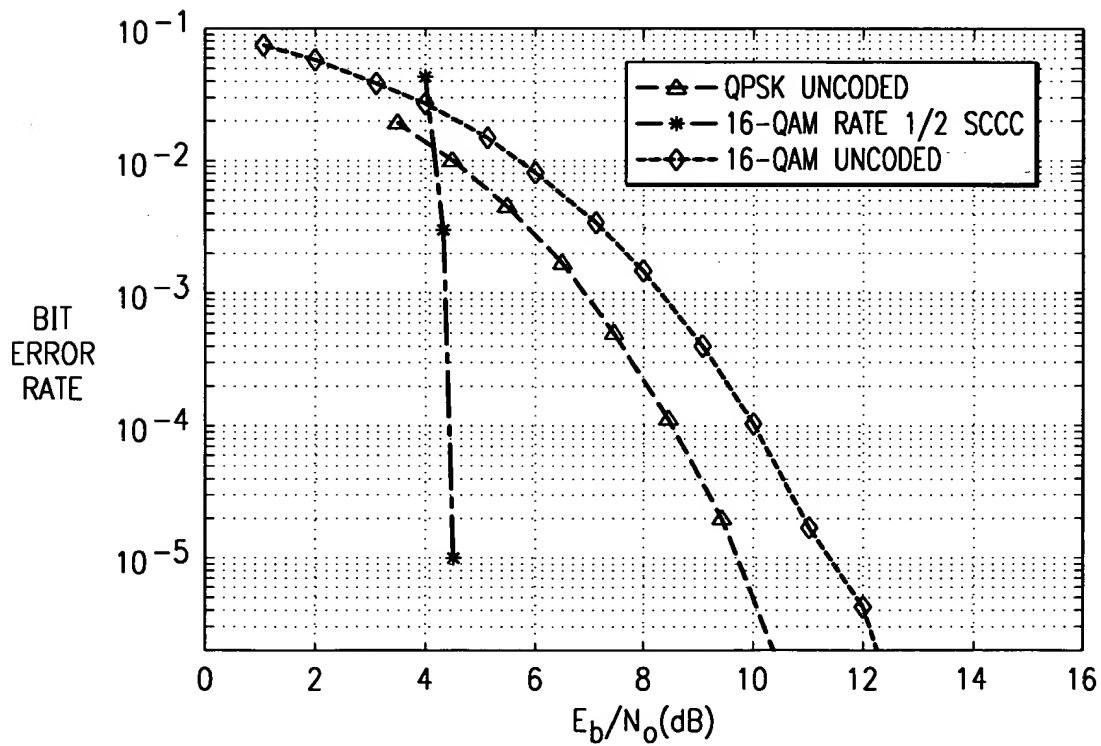


FIG. 41



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FIG. 42

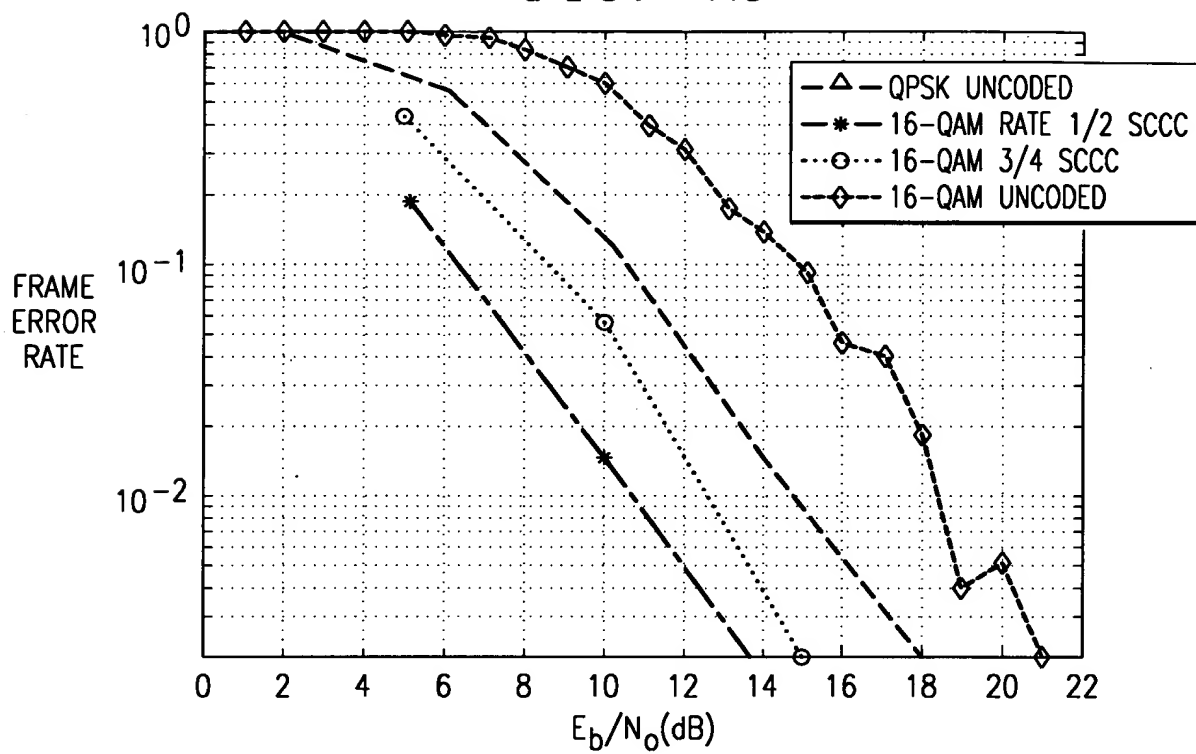


FIG. 43

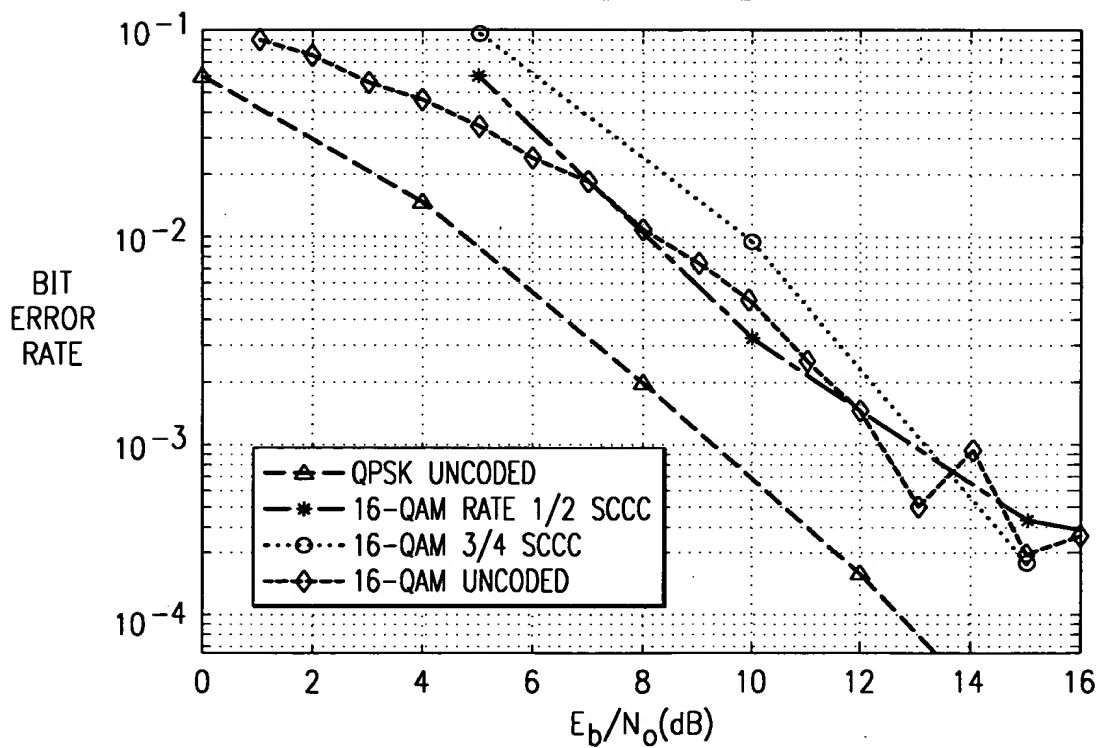


FIG. 44

